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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
GRAHAM, ANDREW R	
ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/986,695	YAMAMOTO ET AL.	
	Examiner	Art Unit	
	Andrew Graham	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4 and 5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4 and 5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 9/06/05 have been fully considered but they are not persuasive.

On page 3, lines 1-4, the applicant has stated, "Milne, however, fails to teach or suggest that these speaker gains are optimized based on the records of acoustic waves propagated to the prescribed location from the front speaker and rear speaker" and "One cannot fairly read Milne's definition of the optimal parameters, including the speaker gains, to teach the limitation of the present invention as recited in claim 1". The examiner respectfully disagrees.

It is well-established that references are applicable for their express, implicit, and inherent disclosures. As part of the optimizing of coefficients (particularly a 'gain' coefficient, as addressed herein), the concept of attenuations of speaker outputs being prerecorded is at least implicit in the disclosure of Milne, if not inherent.

Considering Milne, the settings or coefficients for the system are defined relative to an "optimal performance" level (col. 4, lines 37-41). The adjustment and improvement of these settings or coefficients establish the "optimal performance" (col. 4, lines 37-41). Gain is one of the optimized coefficients (col. 3, lines 61-65; col. 4, lines 27-47). As is well known in the art, the gain coefficient associated with a speaker correlates to the amplitude of the acoustic signal reproduced by the speaker, thereby establishing

the acoustic response of the speaker system in the applied sound field (col. 3, lines 63-65).

Milne notes that non-optimal sound is caused by vehicle characteristics (col. 1, lines 16-19). Thus, the finally applied gain coefficients represent an amount of correction or compensation necessary for deriving a desired or optimized acoustic response for the inside of the vehicle (which again, otherwise affects a non-optimal sound field).

Considering the pertinent claim language, the terminology of Claim 1 recites "attenuations" as being "previously recorded". "Attenuations", per standard terminology in the art, pertain to a relative change in gain, usually a relative decrease in gain. In Milne, the sound field characteristics affected by the vehicle properties, relative to the optimum sound field, correspond to said claimed relative changes in gain, or "attenuations". As noted above, the implemented gain coefficients correct or compensate for said non-optimum changes or attenuations present in the sound field. In order to obtain or affect the desired sound field, such coefficients are understood to be complementary to the gain changes caused by the vehicle, relative to the desired sound field. Thus, by the nature or their implementation, the gain coefficients teach or at least suggest the claimed "attenuations".

Such coefficients are described by Milne as being stored (col. 4, line 47-49). This storage (or flashing) of the coefficients is performed before the normal operation mode of the audio system (col.

4, lines 49-52). The coefficients actually flashed are also determined and stored in a lookup table prior to being implemented into a vehicle on an assembly line (col. 4, lines 34-47). Either form of storage (table/profile or flashing before program mode) reads on "previously recorded" as claimed. Thus, the collective teachings of Milne at least teach or suggest the concept of "attenuations...are previously recorded"

Regarding the "when" clause of the particularly limitation, the derivation of the gain coefficients is based at least in part on trying them in the vehicle and making empirical improvements based thereon (col. 4, lines 37-41). As the final goal -- attaining a optimum performance -- is based on said performance in a vehicle, it is fair to infer that "trying them in the vehicle" and thereby making "empirical" improvements comprises applying sound across the involved speakers and assessing the output thereof from the acoustical space "in the vehicle". Interpretation otherwise would suggest that improvements to the acoustical performance in the vehicle are made without observing the state of the acoustical performance in the vehicle. This notion conflicts with the concept of "empirical improvements" and would otherwise obviate the need for "trying [coefficients] in the vehicle", both of which are taught by Milne. The claimed "prescribed position" is at least inside a vehicle interior and the system of Milne includes front and rear speakers (col. 2, lines 35-39). Thus, in view of the teachings of the other applied references, the nature of gain coefficients of Milne teach or

at least suggest "attenuations when acoustic waves from the front speaker and rear speaker are propagated to the prescribed position". As noted above, the coefficients are variously stored during their implementation, which reads on "previously recorded". Alternatively, the measurement or obtaining of results of "trying" may also be considered to read on "previously recorded". Thus, a fair reading of the teachings, in view of the teachings of d'Alayer de Costemore d'Arc and Cherry, teaches or at least suggests the pertinent limitation in question, at least when said limitation is given its broadest reasonable interpretation.

It Is further noted that the "attenuations" are a property of the vehicle affected during playback of sound. Such playback is not, for the purposes of the vehicle characteristics, not distinguished between testing or actual consumer-use situations (e.g., predetermining phase or normal operation mode of Milne). Thus, the sound characteristics imparted by the vehicle during the "normal mode" operation of the audio system of Milne also read on the "when" clause of the pertinent claim limitation.

As no other arguments or remarks pertaining to the claims are presented, the other grounds of rejection applied to the claimed limitations have been reviewed, determined to be appropriate, and are respectfully maintained herein, as is repeated below.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. **Claims 1-2 and 4-5** are rejected under 35 U.S.C. 103(a) as being unpatentable over d'Alayer de Costemore d'Arc (USPN 5271063) in view of Cherry (USPN 3702901) and Milne et al (USPN 5983087). Hereafter, "Milne et al" will be referred to as "Milne".

d'Alayer de Costemore d'Arc discloses a system for controlling the production of sound in a vehicle, wherein one of the features involves adjusting the respective sound output volumes between front (42) and rear (44) speakers (col. 4, lines 59-68 and col. 5, lines 1-3). The context and function of this system reads on "A volume controller for controlling volume balance between a front speaker and a rear speaker located within a vehicle". This volume adjustment is conducted by a function adjustment control (5) which is associated with a function selecting control (6) (col. 3, lines 54-59 and col. 4, lines 67-68 and col. 5, lines 1-2). These controls (5,6), along with the circuitry that converts the mechanical input to an electrical equivalent, reads on "a fade volume computing unit for computing an amplifying factor of an input signal for providing an increased volume at the rear or front speaker". The system of d'Alayer de Costemore d'Arc also includes a control unit (10) that initializes previously stored settings of the audio system output and also enables an

adjustment circuit (12) to alter the output of an audio signal, based on the controls provided by the function controls (5,6) (col. 4, lines 67-68 and col. 4, lines 1-10 and 27-63). This unit (10) reads on "a control unit". The system includes a memory for storing the audio function parameters, including the fade setting (col. 4, lines 1-3). Upon a change being made to the setting of the fade function, this new setting is applied and then stored (col. 5, lines 2-3). After the new setting has been stored, the operation of the program involves returning the operation of program to its starting point (col. 5, lines 43-46). Collectively, the storage of the new setting and the restarting of the program that controls the operation of the system reads on "capable of dealing with a next fade input with attenuations changed by the amplifying factor kl and the attenuating factor K1 recorded and newly set upon completion of the fade volume computing". However, d'Alayer de Costemore d'Arc does not specify or clearly disclose:

that the amplifying factor k1 for providing an increased volume at the rear or front speaker is equal to a decreased volume at the front or rear speaker when an input signal is attenuated by an attenuating factor K1, so that when a balancing point is moved from a prescribed position, a total volume within the vehicle is unchanged

that the control unit multiplies that signal supplied to the rear or front speaker by the amplifying factor k1

Cherry discloses a volume balance and fader control circuit for a four channel sound reproducing system wherein the average total volume

of the sum of the four channels is not affected by adjusting the balance and fader controls of the system (col. 1, lines 59-67 and col. 2, lines 1-3). In the system of Cherry, adjusting the balance or fader control merely changes the division of DC power and not the sum or overall total gain of the channels (col. 2, lines 16-20). Cherry discloses the system's use in an automobile (col. 3-lines 19-22 and see figures 2 and 3) and that the operator of the auto can balance himself to be in the center of sound (col. 3- lines 41-45). The context of the device also reads on "A volume controller for controlling volume balance between a front speaker and a rear speaker located in a vehicle" (Figure 2). Cherry discloses a balance control for the left and right speaker balancing as well as a fader control for front and back speaker balancing (col. 3-lines 63-67 and col. 4-lines 1-2) which together control the relative output volume of the four channels. Cherry further discloses a potentiometer which acts as the fader control for balancing the audio condition between the forward 22, 26 and back 20, 24 sets of speakers, wherein one end is connected to the first and third channels 36, 40 and the other end is connected to the second and fourth 38, 42 channels (col. 4-lines 40-58). The potentiometer is connected as a voltage divider with a movable contactor dividing the a fixed amount (for example kl,K1) of DC voltage between the forward and rear sets of channels (col. 5, lines 1-4) but providing the total sum of DC voltage remains the same (col. 4-lines 49- 53). This potentiometer (62) and the connected resistances (70,72,74,76,78,80,82,84) involved with the application of

the adjustment to the individual speaker circuits reads on "a fade volume computing unit for computing an amplifying factor k1 of an input signal for providing an increased volume at the rear or front speaker …which is equal to a decreased volume at the front or rear speaker when an input signal is attenuated by an attenuating factor K1". The initial setting of the potentiometer (50a), before adjustment, reads on "by the volume at a prescribed location". The effect of such a connection, Cherry discloses, is that a constant volume is established, despite the respective changes made to the fader controls (col. 5, lines 45-49). This reads on "so that when a balancing point is moved from a prescribed position, a total volume within the vehicle is unchanged". In the system of Cherry, the established volume controls are implemented through a transistor (46) which operates an amplifier (38) that together constitute a translating and amplifier stage (col. 4, lines 12-38). In view of other applied references, the application of such control over the amplitude of the signal applied to each speaker reads on "multiplying the signal supplied to the rear or front speaker by the amplifying factor k1 when the input signal supplied to the front or rear speaker is attenuated by the attenuating factor K1".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement the fade control and gain adjustment method of the system of Cherry as part of the corresponding control program implemented in the control and attenuating stages of the system of d'Alayer de Costemore d'Arc. The

motivation behind such a modification would have been that such a modification would have collectively enabled a user operating the fade control in the system of d'Alayer de Costemore d'Arc to place the user at the center of the reproduced sound field or any desired location, without affecting the average total volume of the sound field. This constant sound volume would have been maintained during the process of balancing, which would have prevented the user from increasing the volume sound field to an undesirable degree while manipulating the relative volume of a speaker or a set of speakers involved with reproducing the sound field.

However, d'Alayer de Costemore d'Arc taken in view of Cherry does not specify:

that attenuations when acoustic waves from the front speaker and rear speaker are propagated to the prescribed location are previously recorded

that on the basis of these attenuations, the increased and decreased volumes at the front or rear speaker are computed

Milne discloses a processing system for a vehicle audio system, wherein the parameters for individual speakers in a particular environment may be obtained from a remote location.

Specifically regarding **Claim 1**, Milne, when considered in view of the disclosures of the other applied reference(s), teaches or at least suggests:

that attenuations when acoustic waves from the front speaker and rear speaker are propagated to the prescribed location are previously

recorded (optimal parameters, including speaker gains are tried in a vehicle and stored; col. 3, lines 61-65; col. 4, lines 27-50; speaker gain for a speaker comprises determination of relative amplification/attenuation of speaker)

that on the basis of these attenuations, the increased and decreased volumes at the front or rear speaker are computed (audio data is processed according to stored functions as well as received control data, which includes fade and balance functions, col. 2, lines 9-11; col. 5, lines 35-41)

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the optimized system parameter implementing circuitry of Milne as part of the system that determines the individual output volumes for the speakers in the system of d'Alayer de Costemore d'Arc in view of Cherry. The motivation behind such a modification would have been that such vehicle-type adjustments would have enabled optimal performance to be empirically determined and installed in vehicle during assembly. Such settings would have accounted for particular properties of a specifica environment, such as a sunroof or leather seats, while using standardized hardware.

Regarding **Claim 2**, d'Alayer de Costemore d'Arc taken in view of Cherry and Milne discloses:

The system of Cherry enables user to place himself or herself in the center of the sound field (col. 5, lines 33-36). The two respective gain controls provided are a balance and fade, wherein fade

alters the relative levels of front and back speakers at all left-right balance positions within the vehicle space (col. 4, lines 20-26 and 27-36 and col. 5, lines 27-36). The signal processing of these individual controls is individually applied to the translating and amplifier stage. This context of operation for a fader, wherein any initial fader setting is enabled in the combined system, reads on "at a prescribed location within the vehicle" and "the prescribed position is located at the center of a front, at a center of a rear seat, or a center between the front seat and rear seat".

Regarding **Claim 4**, d'Alayer de Costemore d'Arc taken in view of Cherry and Milne discloses:

the attenuations (volume settings) are computed on the basis of an input indicative of a relationship between the prescribed position and positions where the front and rear speakers are located (fader control in Cherry enables balancing between front and back sets of speakers, col. 4, lines 59-63; such balancing enables a listener to place herself or himself at the center of sound within area defined by speakers, col. 2, lines 48-54; as such, control of 62 by user is suggestive of relationship between an initial or 'prescribed' position and a desired location of center of sound within the area defined by the speakers; for example, forward balance suggests desired location is closer to area of front speakers as compared to initial location, and rearward balancing suggests desired location is closer to area of rear speakers as compared to initial location).

Regarding **Claim 5**, the adjustment in the system of Cherry includes a main volume control (64) that controls the volume adjustments at each of the speakers (col. 5, lines 20-25) and d'Alayer de Costemore d'Arc discloses such a function being the default of the adjustment control (col. 4, lines 3-5). Collectively, these two teachings read on "the increased volumes of the front or rear speaker and of the rear or front speaker are computed on an adjustment value in a level adjusting means to be connected to the front speaker and the rear speaker".

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Allred et al (USPN 6721428) serves as an example of sound field optimization well-known in the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 571-272-7517. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached at 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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November 23, 2005